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<p>(21) International Application Number: PCT/AU89/00062 (22) International Filing Date: 16 February 1989 (16.02.89) (31) Priority Application Number: PI 6794 (32) Priority Date: 16 February 1988 (16.02.88) (33) Priority Country: AU (71) Applicant (for all designated States except US): LATERAL DESIGN PTY. LTD. [AU/AU]; 1A The Crescent, Chatswood, NSW 2067 (AU). (72) Inventor; and (75) Inventor/Applicant (for US only) : JUDD, Gary, Michael, Clayton [AU/AU]; 1A The Crescent, Chatswood, NSW 2067 (AU). (74) Agent: ARTHUR S. CAVE & CO.; Level 10, 10 Barrack Street, Sydney, NSW 2000 (AU).</p>		<p>(81) Designated States: AT, AT (European patent), AU, BB, BE (European patent), BG, BJ (OAPI patent), BR, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CM (OAPI patent), DE, DE (European patent), DK, FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, RO, SD, SE, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US. Published With international search report.</p>
<p>(54) Title: CARRYING DEVICE AND METHOD OF ASSEMBLY THEREOF</p>		
<p>(57) Abstract</p> <p>The present invention relates to a carriage device of the type and class known as a stretcher or litter having a load bearing cradle sheet supported by at least two carry handles. The device comprises a continuous or segmented cradle sheet (7) having means (8) connected thereto or integral therewith to releasably engage at least one outstanding retaining buckle (6) on each of carry handles (2, 3, 4, 5).</p>		

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CARRYING DEVICE AND METHOD OF ASSEMBLY THEREOF

The present invention relates to a carriage and/or lifting device and a method of assembly and disassembly of such a device for use in carrying articles and objects such as but not limited to human bodies. More particularly, the invention relates to stretchers and/or litters of the general type having a flexible load support cradle sheet connected to gripping handles whereby the cradle sheet and handles may be readily assembled and disassembled.

Although the carriage device of the present invention will primarily be described with reference to its application in carriage of sick, dead or injured persons this is not to be construed as a limiting application of the invention as the article to be carried is largely inconsequential to the utility of the device.

There are in existence a number of different stretchers used in the first aid and ambulance field for use in the carriage of injured, sick or dead bodies.

These generally comprise a cradle sheet comprising a woven fabric or like soft, pliable material such as plastic or other synthetic which is attached to carry beams which generally run longitudinally along the periphery of the cradle material. The beams of the prior art devices generally terminate at their ends in carry handles which enable an operator to grip the stretcher one at each end. Whilst these stretchers have proven to be useful, they do have the significant disadvantage that they require a body to be lifted rather than rolled onto the stretcher. This constitutes both a difficulty to the assistants and a danger to a patient particularly if an injury has been sustained which makes movement of the patient unwise. Furthermore, there is no economic or speedily efficient means of removal and disposal or replacement of the cradle sheet in the event of damage or soiling of the sheet. This problem raises hygiene considerations for both user and patient where sheets are constantly reused without laundering.

One attempt was made to ameliorate the aforesaid problems by providing a carrying device in the nature of a stretcher or litter and which constituted a compromise between utility and versatility. The subject prior art
5 comprises a woven fabric cradle sheet divisible into two portions and comprising joining means for attaching said portions. The sheet material also has loops which are adapted to receive carry handles therethrough.

Whilst this stretcher offers the advantage that it
10 can be readily detached from the handles by sliding the handles through the loops and divided into two portions by release of the said joining means when the fabric cradle is to be pulled from under the patient, the handle connection arrangements are unsafe in that they are
15 predisposed towards sliding out of the loops and the means for disconnection of the two portions is not entirely suitable as often the joining strap must be pulled when under the dead weight of a patient or other article on the stretcher. Furthermore, the fabric used
20 in these stretchers is not intended for disposal in the event of soiling with blood or other matter. When the prior art sheets are to be cleaned, difficulties arise due to the ingress of soiling or infection matter between weaves and stitches.

25 The present invention therefore, seeks to ameliorate the disadvantages of the prior art stretchers by providing a stretcher having versatility in handling and assembly, optional disposability of the cradle sheet, security in relation to handle attachment and the ability
30 to adjust the handles so as to optionally stiffen the support along the end edges and longitudinal edges of the sheet where articulation of the stretcher at the mid length region is not required.

It is one object of the present invention to
35 provide a carriage having an optionally disposable and readily removable sheet spanning between carry handles and removable therefrom by interleaving of tabs (integral there with or connected to the sheet) through a support buckle on the carry handles having means to enable the

said interleaving.

One major disadvantage with all of the prior art devices resides in the fact that the cradle sheet material used is not disposable and therefore is
5 unhygienic in many cases.

The present invention combines a disposable sheet with a highly strong and effective releasable facility for engagement between the sheet and handle mechanisms without compromise to the overall structural integrity
10 which existed in the prior art devices.

In its broadest form the present invention comprises;

a carriage device of the type and class known as a stretcher or litter and having a cradle sheet supported
15 by at least two carry handles characterised in that the device comprises;

a continuous or segmented cradle sheet material having means connected thereto or integral therewith to releasably engage at least one outstanding retaining
20 buckle on said carry handles.

In the preferred embodiment the said releasable engagement between said sheet and handles effected by interleaving of said means around at least one loop and return buckle attached to each of said handles.

25 In the preferred embodiment the said means on said sheet comprise tabs which outstand from the side edges of the sheet and which are configured so as to releasably engage said buckles. Furthermore, the said buckles are optionally adapted to be movable along or around said
30 handles or fixed in one position.

In the broadest form of the method aspect the present invention comprises:

- a) laying an opened out cradle sheet prostrate on the ground,
- 35 b) laying first and second handles on the ground adjacent opposing edges of said sheet,
- c) feeding a tab on said sheet through a first opening at least partially formed by or in said buckle which is on said first handle,

- d) feeding the end of the tab back through a second opening formed by or in said buckle,
- e) repeating the process for additional buckles,
- f) repeating the process for said second handle.

5 According to the method aspect the present invention comprises a method of assembly of a carriage device comprising the steps of

- a) laying an opened out cradle sheet prostrate on the ground,
- 10 b) laying first and second handles on the ground adjacent the longitudinal edge of said sheet so that at least one buckle on said handles is faced away from said sheet,
- c) feeding a tab on said sheet over said first handle thence through a first opening,
- 15 d) feeding the end of the tab back through a second opening so that the end of said tab points in the direction of the said sheet,
- e) rotating the handle in a direction away from the sheet so as to effect gripping engagement between the tab of said sheet and said handle;
- 20 f) repeating the process for each buckle and for said second handle.

25 The invention will now be described in more detail according to a preferred but non limiting embodiment of the invention and with reference to the accompanying illustration wherein:

Figure 1: shows an assembled stretcher or litter according to the preferred embodiment of the present invention.

30 Figure 2: shows a developed profile view of the cradle sheet used in the stretcher of figure 1.

Figures show the steps in the method of attachment 3a, b & c: sheet of the cradle sheet of figure 2 to the handles of the stretcher in figure 1.

35 Figure 4: shows an alternative handle arrangement to that shown in figure 1.

Figure 5: shows the handles of figure 4 with a cradle sheet attached.

Figure 6: shows the device of figure 5 with handles on either side of the cradle sheet mated.

Figure 7: shows an exploded view of the invention according to an alternative embodiment having detachable end handles disposed at either end of the device which are adapted to engage the ends of the carry handles.

Figure 8: shows the device of figure 7 with the end carry handle attached.

Figure 9: shows a smaller version of the embodiment of figure 7 without the junctions at the midpoint of the handles.

Figure 10, 11 and 12:

shows the end handles used in the device of figure 9 joined together following the elimination of the carry handles according to varied embodiments.

Figure 13: shows a partially exploded view of the embodiment of figure 8 but this time with segmented cradle sheets.

Figure 1 shows the carriage device 1 of the present invention according to a preferred embodiment. The device comprises generally carry handles 2, 3, 4, 5 each having at least one fixed or movable buckle 6 which enables detachable support of a cradle sheet 7 via tabs 8 which are attached to or integral with the sheet 7.

Figure 2 shows a plan view of one configuration of the cradle sheet 7 with a series of outstanding tabs 8. Figures 3a, b and c diagrammatically detail the steps in interleaving the tabs 8 with typical buckle 6 located on handle 3 for illustration. The device 1 is assembled according to the following steps. Sheet 7 is laid prostrate with tabs 8 pointing outwardly as shown in figure 2. Next, the handle 3 is laid substantially parallel to the longitudinal axis of the cradle sheet 7 with the buckle 6 turned away from the preventing tab. The tab 8 is then fed through gap 9, under bars 10 and 11 which form buckle 6, thence back through gap 12 between the bars. Arrow 13 defines the path of the tab 8 through

gap 12 of bars 10 and 11. Once the tab 7 has been placed in this position as shown in figure 3b the handle 3 is then rotated in the direction of arrow 14 so as to jamb and restrain the tab from slipping out of the buckle 6.

5 The resultant tension of the tab when the sheet is under load tends to increase the binding effect about bars 10 and 11. The binding effect is at its strongest when the cradle sheet is under maximum load. In the preferred embodiment the cradle sheet 7 is made of polyethylene or

10 polypropylene which is intended to be disposable however a longer life material such as a woven fabric could be substituted. Once the handle 3 is rotated to the position shown in figure 3c and once all tabs of the cradle sheet are connected to their respective buckles 6

15 the carriage device 1 is ready for load carriage.

This device is particularly suitable for carrying injured, sick or dead people, especially where limited movement of such a person is desirable prior to carriage. The device is also suitable where limited

20 patient movement or manual lifting of a patient onto a stretcher is required is necessitated. In this case the patient may be rolled onto the cradle sheet first one way thence the opposite way before the handles are connected. The embodiment of figure 1 is also suitable

25 where some articulation of the carriage device is required. Handle 3 is adapted with a telescopically operable member adapted to connect with end 16 of handle 2 to effect engagement between the handles. In like fashion, engagement between handles 4 and 5 is effected

30 to form a single handle 20 running almost the full length of the carry sheet. This option is available where a more stiffened carriage device is required.

For added safety, a spring loaded locking device holds the male joining member in position to effect

35 positive engagement between the initially separate handles.

Although figure 1 shows two buckles per handle, it will be appreciated that a series of buckles could be used according to requirements.

Figure 4 shows an alternative configuration of buckles on carry handles 2, 3, 4 and 5 whereby there are three aligned buckles. The two handles 2 and 3 or 4 and 5 may also be attached together via two adjacent buckles by means of a flexible ring 17 or analogous linkage. This ring allows out of alignment movement of the handles with respect to each other but prevents handle separation. This arrangement has the advantage of providing limited articulation whilst preventing unwanted handle separation. Figure 5 shows the embodiment of figure 4 with a cradle sheet 18 attached. Figure 6 shows the embodiment of figure 5 but this time with handles 2 and 3, 4 and 5 linked together by means of male female mating of male profile part 15 and end 16. The figure shows the handles mated together to form full length rigid handles 19 and 20.

It will be appreciated that the male profile part 15 and end 16 can be interchanged without affecting the resultant connection between the handles 2 and 3 or 4 and 5.

In an alternative embodiment of the present invention the carrying device of figure 6 is shown in figures 7 and 8 with the addition of end support handles 21 and 22. Figure 7 shows an exploded view of the device and figure 8 shows the handles 21 and 22 in situ. The end handle 21 is essentially a mirror image of handle 22 and comprises a substantially U shaped portion which defines first and second legs 23 and 24 respectively and a bight whose base is bounded formed by member 25.

Each leg has a telescopic male member 26 shown extended from member 24 which is adapted to engage a corresponding female recess 27 in the handles 19 and 20. The end handles 21 and 22 facilitate end carriage and stiffen the device peripherally for circumstances where rigid support of all edges of the sheet 7 is required. Member 25 is preferably adapted with a buckle 29 to receive an end tab 30 on sheet 8 as shown in figure 8.

Figure 9 shows a further embodiment of the invention with the longitudinal handles abbreviated so

that handles 2 and 4 remain unlike previously described embodiments. Connections of the sheet 7 to the handles are effected in a similar manner to that previously described for the other embodiments. End handles 21 and 22 are shown engaged with handles 2 and 4. This configuration of the invention is appropriate for small persons such as babies and children or small articles.

Figures 10, 11 and 12 show another embodiment of the invention whereby handles 21 and 22 are interengaged to form a miniature carriage device. In this embodiment a miniature cradle sheet 32 (see figure 12) is used. Junction between handles 21 and 22 is effected in a similar manner to that previously described with reference to figure 7 and 8.

Figure 13 shows an exploded view of one further embodiment of the invention where a segmented cradle sheet has been utilised. The sheet is made from like but discrete intermediate segments 33 and end segments 34. End segments 34 differ from segments 33 in that they have an additional end tab 35 which engages with buckles 29.

It will be recognised by persons skilled in the art that numerous variations and modifications may be made to the invention as hereinbefore described, without departing from the overall spirit and scope of the invention.

THE CLAIMS:

1. A carriage device of the type and class known as a stretcher or litter and having a load bearing cradle sheet supported by at least two carry handles, characterised in that the device comprises;
a continuous or segmented resilient cradle sheet having means connected thereto or integral therewith to releasably engage at least one outstanding retaining buckle on each of said carry handles.
2. A carriage device according to claim 1 wherein the said means on said cradle sheet comprises at least two outstanding tabs each of which engage with or interleave with one of said outstanding retaining buckles on said handles.
3. A carriage device according to claim 2 wherein the said outstanding tabs are disposed on opposite edges and/or on opposite ends of said cradle sheet.
4. A carriage device according to claim 3 wherein said outstanding retaining buckles are either integral with or fixedly or detachably affixed to said handles.
5. A carriage device according to any one of the foregoing claims wherein said buckles are movable about or along said handles so as to enable alignment and said engagement or interleaving with said tabs.
6. A carriage device according to claim 5 wherein there are at least two carry handles along each longitudinal edge of said cradle sheet.
7. A carriage device according to claim 6 wherein one buckle of one of said handles along one side of said sheet is optionally connected by a linkage ring to an adjacent buckle on an adjacent handle on the same side.
8. A carriage device according to claim 7 wherein each of one of said carry handles is adapted with mating means to optionally mate end to end with an adjacent handle or to receive mating means from an adjacent handle.
9. A carriage device according to claim 8 wherein the said mating means comprises a telescopically extendable member on at least one end of said handles.
10. A carriage device according to claim 9 wherein when

two handles are connected end to end along the longitudinal edges of said sheet, a single handle is formed along the longitudinal edge of said sheet to support said cradle sheet therealong.

11. A carriage device according to claim 10 wherein each of said handles when detached from an adjacent handle or handles have two or three buckles therealong.

12. A carriage device according to any one of the foregoing claims wherein the said cradle sheet comprises one or more discrete sheet elements each of which, have at least one tab at either end which links with a buckle or buckles on said handles to thereby provide a load carriage span between said handles.

13. A carriage device according to claim 12 further comprising end carry handles adapted to mate with the longitudinal extremity of each of said carry handles so as to form an end carriage support and hence full peripheral support about said cradle sheet.

14. A carriage device according to claim 13 wherein the end carriage support comprises a primary support bar having return portions terminating in first and second ends each of which engage with the said longitudinal extremities of each of said handles via said mating means.

15. A carriage device according to claim 14 wherein said first and second ends have male or female profile parts to engage with corresponding female or male profile parts on said extremities of each of said handles so as to effect the mating between said carry handles and said end handles.

16. A carriage device according to claim 15 wherein the said male profile parts on said first and/or second ends are telescopic.

17. A carriage device of the type generally comprising handles with a cradle sheet attached to and spanning between said handles;
characterised in that the device comprises first and second handles which each comprise;
a substantially U shaped member defining a bight and also first and second legs each having at or near their

extremities male or female profile parts which mate with corresponding male or female profile parts on said first or second handle to effect engagement between said handles.

18. A carriage device according to claim 17 wherein each of said handles comprise at least one buckle to releasably engage a cradle sheet spanning therebetween.

19. A carriage device according to claim 18 wherein the said buckle or buckles are located on each handle on the portion forming the base portion of said bight.

20. A carriage device according to any one or more of the foregoing claims wherein each of said buckles comprise a pair of spaced apart bars fixedly attached at least one of their ends to said handle.

21. A carriage device according to any one of claims 1 to 19 wherein each of the said buckles comprise a double ring or bar set anchored along part of their edges either indirectly or directly to said handles.

22. A method of assembly of a carriage device comprising the steps of:

- a) laying an opened out cradle sheet prostrate on the ground,
- b) laying first and second handles on the ground adjacent opposing edges of said sheet,
- c) feeding a tab on said sheet through a first opening at least partially formed by or in said buckle which is on said first handle,
- d) feeding the end of the tab back through a second opening formed by or in said buckle,
- e) repeating the process for additional buckles,
- f) repeating the process for said second handle.

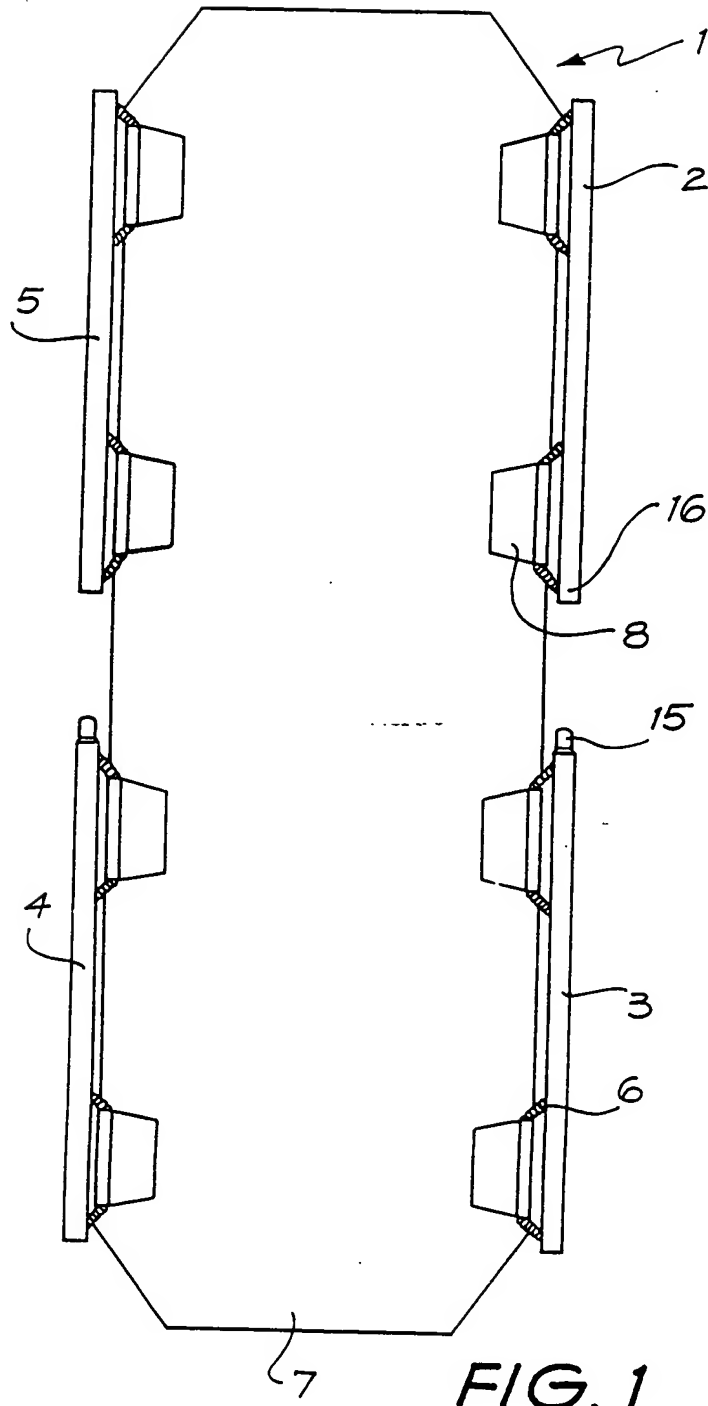
23. A method of assembly of a carriage device comprising the steps of:

- a) laying an opened out cradle sheet prostrate on the ground,
- b) laying first and second handles on the ground adjacent opposing longitudinal edges of said sheet so that at least one buckle on said handles is faced away from said sheet,

- c) feeding a tab on said sheet over said first handle thence through a first opening at least partially formed by or in said buckle,
- d) feeding the end of the tab back through a second opening formed by or in said buckle so that the end of said tab points in the direction of the said sheet,
- e) rotating the handle in a direction away from the sheet so as to effect gripping engagement between the tab of said sheet and said handle,
- f) repeating the process for each buckle and for said second handle.

24. A method according to either claim 22 or 23 wherein the first opening is formed between the buckle and said handle and the second opening is formed by spaced apart bars or rugs forming said buckles.

25. A carriage device or method of assembly or a carriage device according to any one of the foregoing claims wherein the cradle sheet is disposable after each use.



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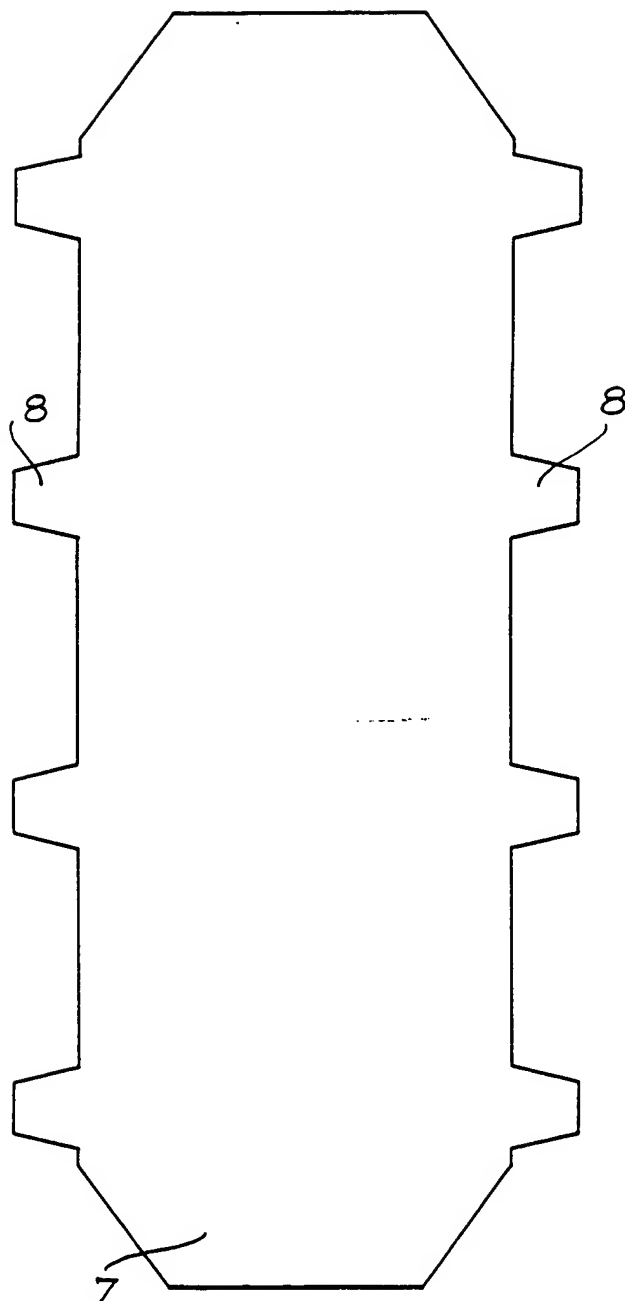
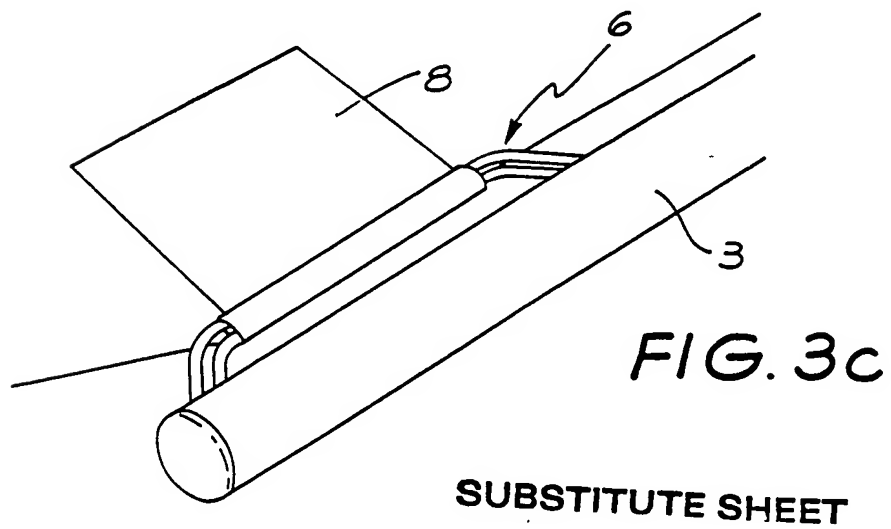
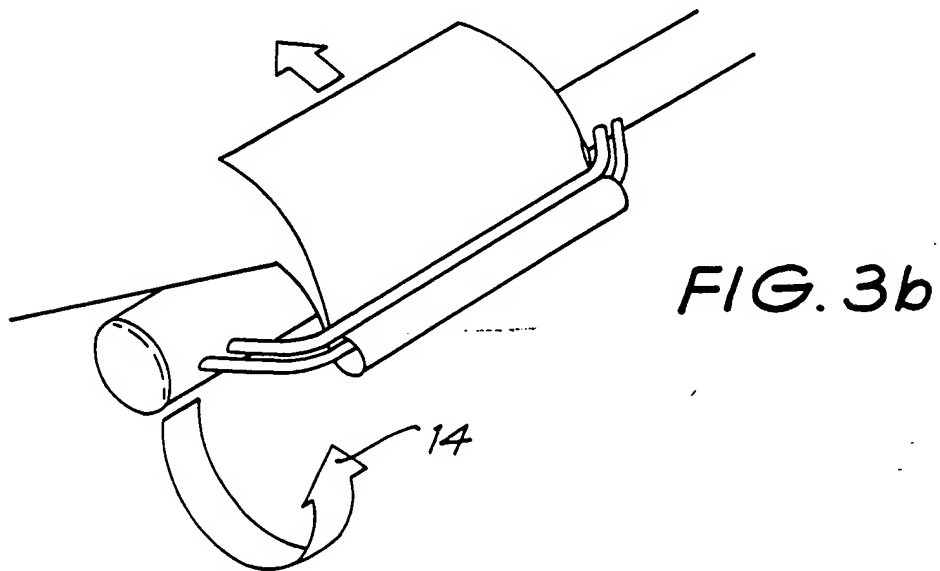
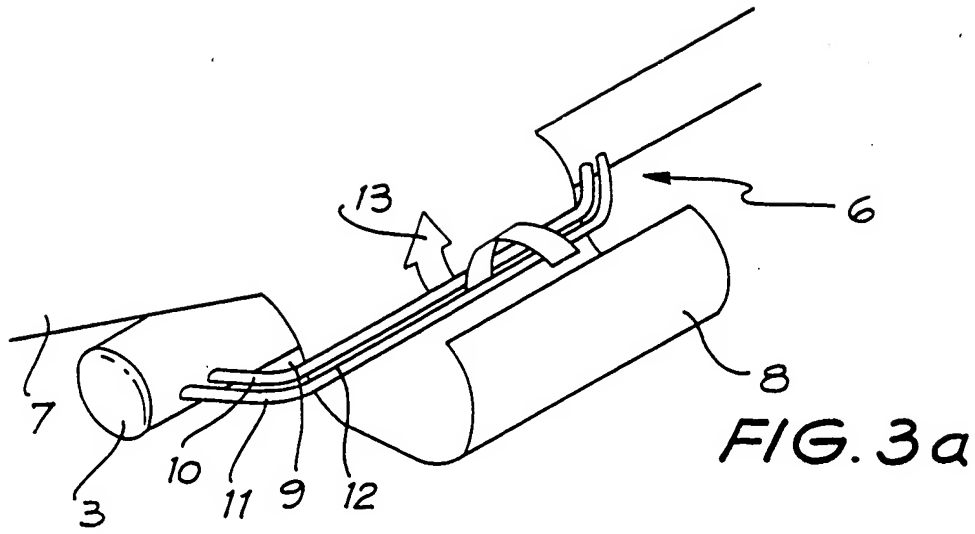


FIG. 2

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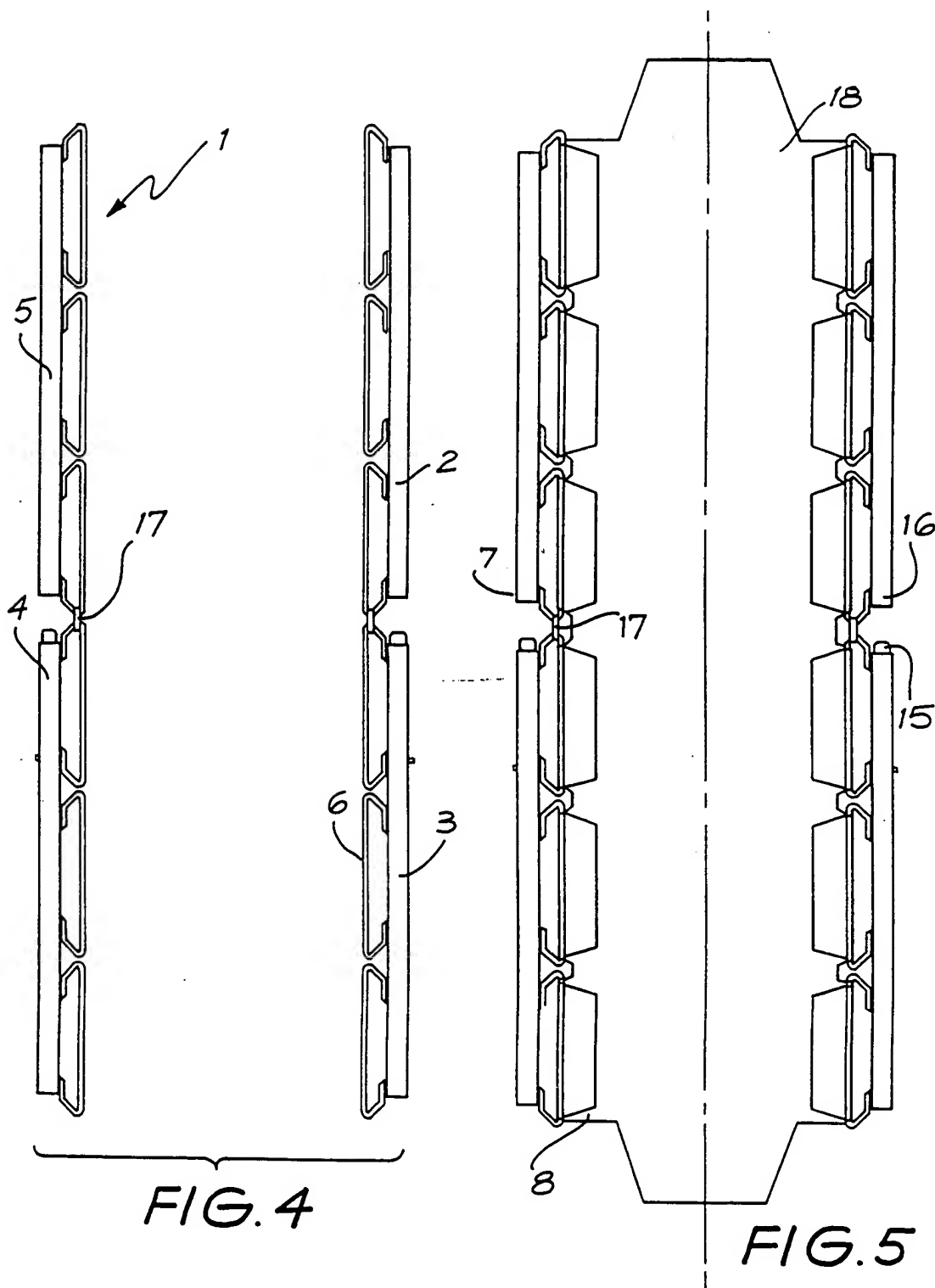
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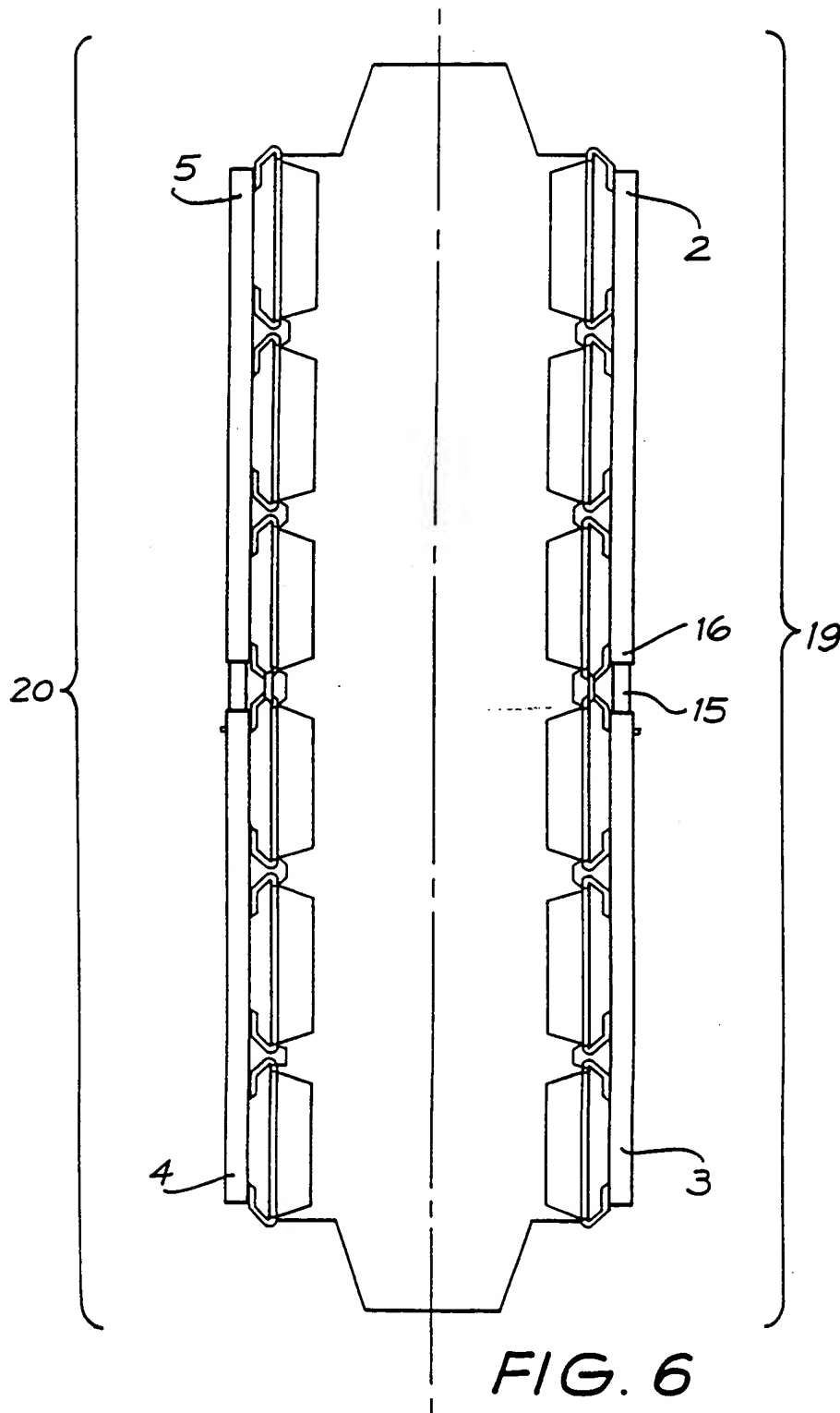


FIG. 6

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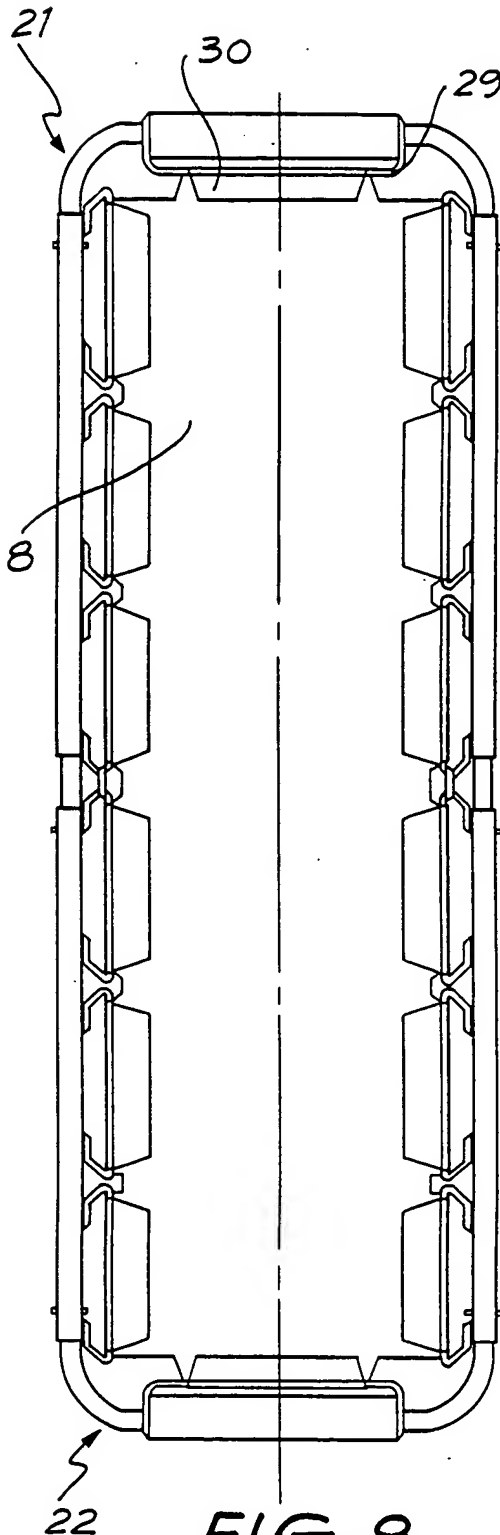


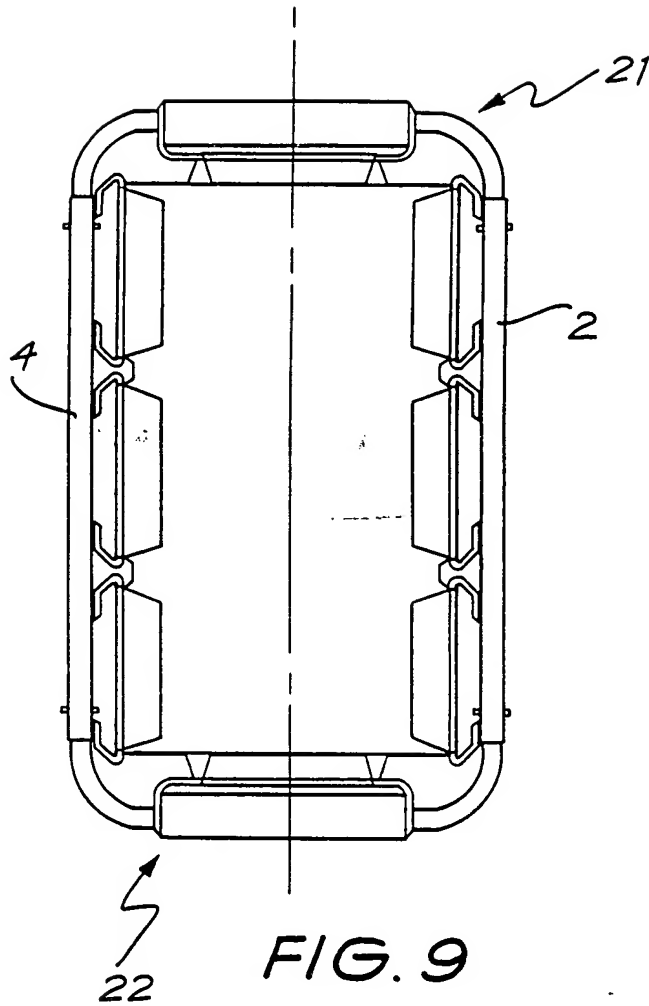
FIG. 7

FIG. 8

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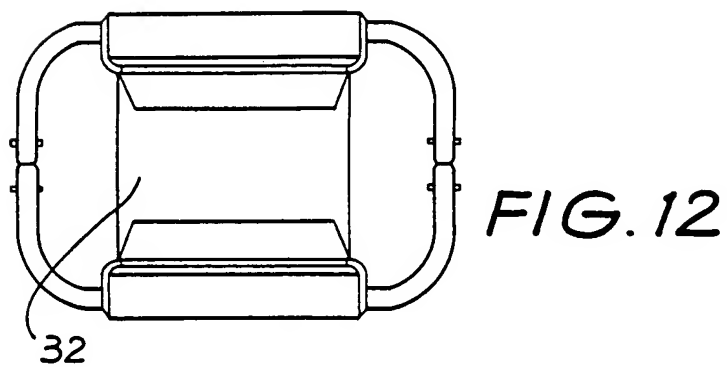
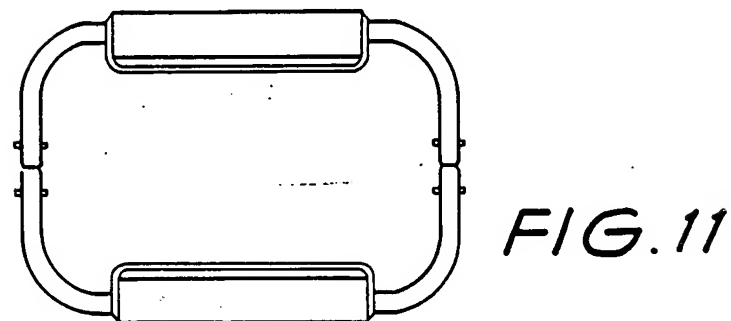
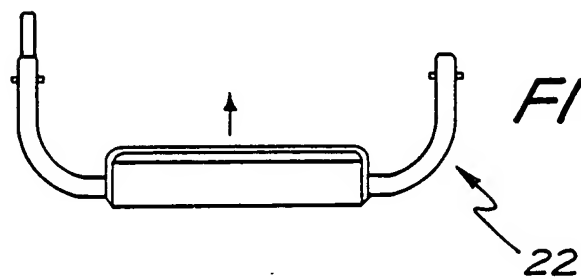
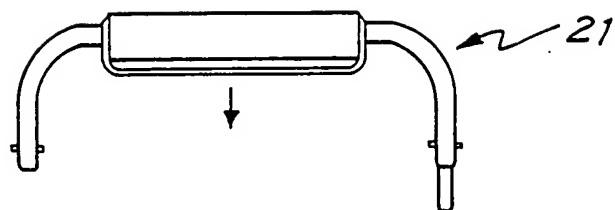
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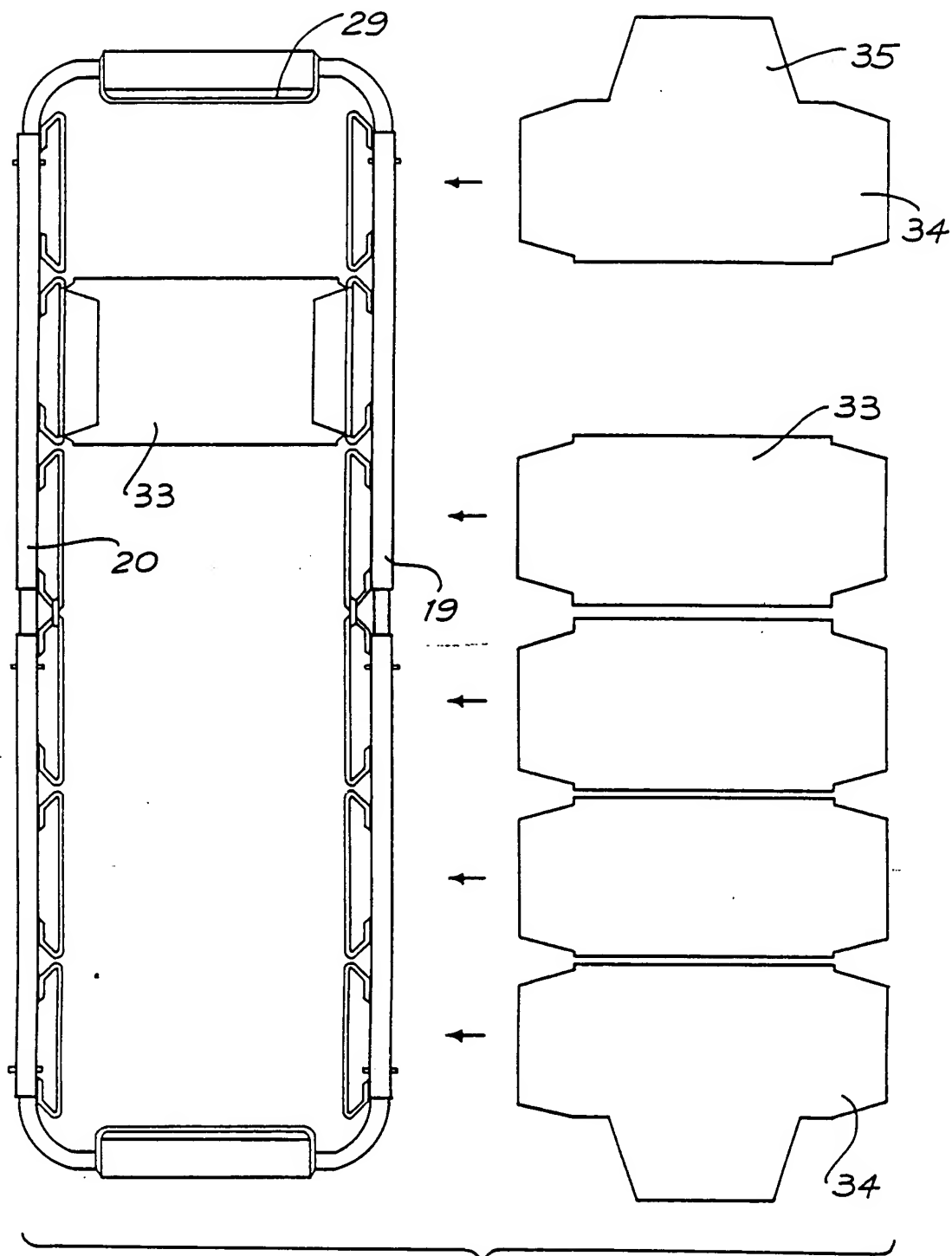



FIG. 13

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INTERNATIONAL SEARCH REPORT

International Application No PCT/AU 89/00062

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) * According to International Patent Classification (IPC) or to both National Classification and IPC Int. Cl. ⁴ A61G 1/00, 1/04						
II. FIELDS SEARCHED Minimum Documentation Searched * <table border="1"> <tr> <th>Classification System</th> <th>Classification Symbols</th> </tr> <tr> <td>IPC</td> <td>A61G 1/00, 1/04</td> </tr> </table> Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched * AU : IPC as above			Classification System	Classification Symbols	IPC	A61G 1/00, 1/04
Classification System	Classification Symbols					
IPC	A61G 1/00, 1/04					
III. DOCUMENTS CONSIDERED TO BE RELEVANT *						
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³				
X	US,A, 2614266 (SMITH) 21 October 1952 (21.10.52)	(1-5,12,18,19)				
Y		(12,13,18,19)				
X	AU,B, 39967/72 (458157) (JORDAN) 20 September 1973 (20.09.73)	(1-4)				
X	FR,A, 1069248 (TAUDOU) 6 July 1954 (06.07.54)	(1-4)				
X	DE,A, 1810628 (C.H.F. MULLER GMBH) 10 September 1970 (10.09.70)	(1-4,25)				
Y		(12,13,18,19)				
Y	GB,A, 1494143 (FERNO-WASHINGTON, INC.) 7 December 1977 (07.12.77)	(12,13,18,19)				
Y	US,A, 4480345 (DUNN) 6 November 1984 (06.11.84)	(12,13,18,19)				
Y	US,A, 3574871 (GREENE) 13 April 1971 (13.04.71)	(12,13,18,19)				
A	DE,A, 3031116 (KOHNE) 22 April 1982 (22.04.82)					
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IV. CERTIFICATION						
Date of the Actual Completion of the International Search 8 May 1989 (08.05.89)		Date of Mailing of this International Search Report 22 May 89 (22.05.89)				
International Searching Authority Australian Patent Office		Signature of Authorized Officer 				

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